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ABSTRACT

This report highlights the trends and problems associated with rapid price increases of foreign-published journals, especially science and technology journals. It is observed that a combination of effects--e.g., discriminatory pricing on the part of some foreign publishers, the sharp decline of the U.S. dollar--have resulted in subscription cancellation and the curtailment of journal purchases by libraries. The principal causal factors for price increases are examined--e.g., high printing costs, page number growth in journals, the sheer number of new journals on the market, the inelasticity of a concentrated foreign publishing market--and various measures to reduce journal costs are discussed. These include: increasing the general awareness of the problem among faculty administrators and government bodies; examining journal use patterns; applying pressure to selected publishers; and increasing competition in the journal publication business. It is noted that professional societies are generally more cost-effective than private publishers in the publication of physics journals. It is suggested that the increased use of electronic technology may help in the longer term, but that the costs associated with these new systems and networks will likely increase current library budgetary problems. Four graphs are included which: (1) identify 1975-1987 serial price trends in university libraries; (2) compare 1985-1987 foreign and U.S. serial costs; (3) identify 1981-1987 serial cost increases for three publishing companies; (4) and profile the serial cost effectiveness of physics journals for eight publishing companies. (MAB)

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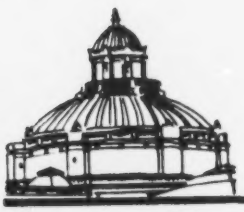
CRS REPORT FOR CONGRESS

RESEARCH JOURNAL PRICES - TRENDS AND PROBLEMS

Richard E. Rowberg, Chief
Science Policy Research Division



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RESEARCH JOURNAL PRICES - TRENDS AND PROBLEMS

SUMMARY

Over the past two decades, prices of scholarly journals have grown much faster than inflation. As the percentage of journals purchased by U.S. research libraries from foreign publishers has grown, this trend was exacerbated by discriminatory pricing on the part of some these foreign publishers, and by the recent sharp decline of the dollar. This growth in journal prices caused large budget shortfalls for university libraries resulting in subscription cancellation, inability to order new journals and curtailment of book purchases.

Principal causal factors for the price rise include high printing costs, rapid growth of the number pages per journal and the introduction of large numbers of new journals in recent years. Further, studies have shown that the price increases are usually concentrated in a small portion of all journals published--usually science and technology journals. In addition, there has been considerable market concentration as a few, primarily foreign publishers have gained a large share of the business over the last few years. The last point is particularly important because the market for scholarly journals traditionally has been considered rather inelastic.

In addition to cost cutting measures, research libraries have tried to increase general awareness of the problem among faculty administrators and government bodies, examined journal use patterns, applied pressure to selected publishers, and attempted to increase competition in the journal publication business. Studies of serial prices and content reveal that professional societies are generally more cost-effective than private publishers in the publication of physics journals. For the longer term, increased use of new electronic technology may help, but the costs of acquiring and setting up such electronic systems and networks are likely to increase libraries' budget problems in the near term.

Any options to deal with the problem will require a better understanding of the consequences of reduced access to journals by researchers. Although there is strong evidence of the importance of timely access to information for efficient and successful science and engineering research, the importance of having immediate access to published journal articles is much less clear. One issue is the degree consolidation of journal collections in a few, centrally located research libraries is possible without adversely affecting research.

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RESEARCH JOURNAL PRICES - TRENDS AND PROBLEMS

INTRODUCTION

Over the last several years, the prices of scholarly journals have increased significantly above inflation. In addition, during the mid-1980s, certain foreign publishers charged U.S. customers much higher prices for journals than those quoted for customers in the country of the journal's publication. Finally, the sharp decline of the dollar since early 1985 has forced a commensurate increase in the price of foreign journals. The combination of these events has resulted in severe budgetary problems for U.S. research libraries, particularly university and college libraries. As a result, research libraries have had to cancel many subscriptions, where possible, and reduce book purchases in order to come up with funds for necessary journal subscriptions. Continuation of these actions is quite likely for the near future at least.

CURRENT SITUATION

In figure 1, the price pattern for serials purchased by university and college libraries since 1975 from The Faxon Company, a large U.S. subscription agent, is shown along with the consumer price index.[1] [2] [3] The two quantities

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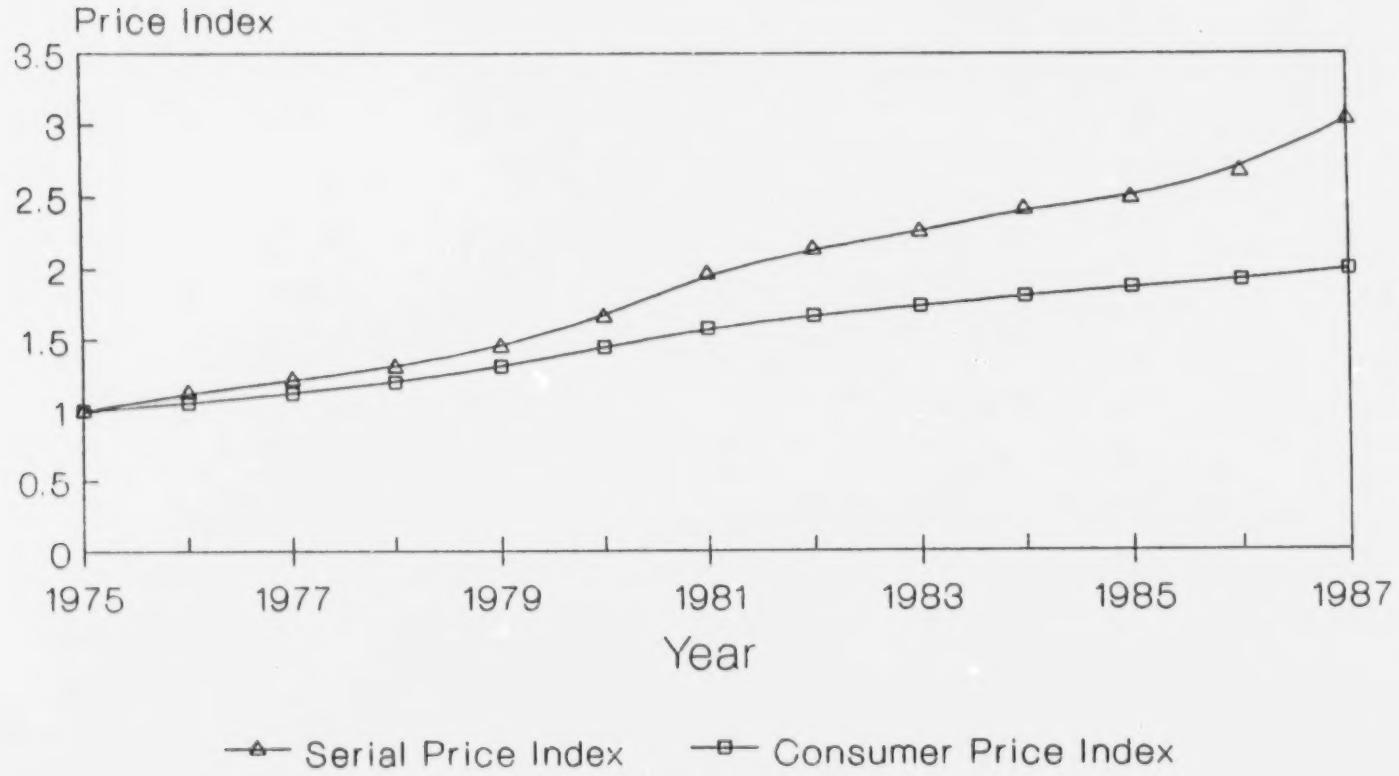
[1] Lenzini, Rebecca T. Periodical Prices 1985-1987 Update. The Faxon Co., Westwood, Mass.

[2] Okerson, Ann. Periodical Prices: A History and Discussion. Advances in Serials Management, v. I. JAI Press Inc., 1986. p. 110.

[3] Economic Report of the President, U.S. Govt. Print. Off., Washington, 1988. p. 316.

Serial Price Trends
University and College Libraries



1975 = $34.55 for serials
Source: The Faxon Company

Figure 1

CRS-2

are converted into an index by dividing the value for each year by their respective 1975 values. Therefore, the index for each is one in 1975. As seen, the price of journals purchased from Faxon has grown substantially higher than inflation. The average journal which cost $34.55 in 1975 cost $104.69 in 1987, an average annual increase of 9.7 percent. Other indexes have shown even greater gains. For example, the American Library Association (ALA) index of serial prices rose an average of 11.6 percent per year from 1975 to 1985.[4]

In addition to the general price rise, libraries in the U.S. also experienced discriminatory pricing in the mid-1980s from foreign publishers.[5] In the early 1970s, foreign publishers began quoting prices to U.S. buyers in U.S. dollars at the then current exchange rate. As the journal prices increased in the currency of the country in which the journal was published, the publisher would also increase the U.S. posted price by the same percentage. As long as exchange rates remained fairly steady, the prices charged to U.S. and country of publication customers were fairly equivalent. When the dollar began to rise sharply in the early 1980s, however, many publishers, particularly those in Great Britain, did not lower the U.S. prices to account for these large exchange rate changes, but instead continued to increase the U.S. prices in concert with, and sometimes higher than, the price charged to their domestic customers. This practice resulted in a very large price discrimination to U.S. customers. One study indicated that in 1984, U.S. libraries paid a two-thirds premium on a large number of titles from United

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[4] Okerson, op. cit., p. 105.

[5] Tuttle, Marcia. Discriminatory Pricing of British Scholarly Journals for the North American Market: An Overview. Serials Librarian, v. II, no. 3,4, Dec. 1986-Jan. 1987.

Kingdom publishers compared to subscribers in the United Kingdom.[6] This premium was equivalent to an effective exchange rate of $3.20 per British pound when the actual exchange rate was $1.30.[7] This practice has abated to a large extent because of complaints and pressure by U.S. subscribers and library associations. For example, one British publisher promised to hold journal prices at the 1985 level for the years 1986 and 1987 with some exceptions.[8] It should be noted, however, that foreign publishers did not lower prices to the United States. Rather, to eliminate the discrimination most of these publishers raised prices to their domestic customers.

The abatement of pricing discrimination began, however, just when the value of the dollar began to fall. From July 1985 to today, the dollar has dropped 42.5 percent relative to the German mark and 42.9 percent relative to the Dutch guilder, although nearly all the change took place prior to the beginning of 1988. Since the three major foreign publishers of serials are located in the Netherlands, Germany and England, these changes have had an enormous effect on library budgets. Therefore, U.S. libraries have experienced very large price growth for foreign published journals, which are making up an increasing share of total serial titles. Figure 2 shows price increases, from selected countries, between 1985 and 1987, according to titles handled by the Faxon Company.[9] Continuation of the dollar's fall from 1987 has raised prices still further and U.S. research libraries have been told by subscription agents

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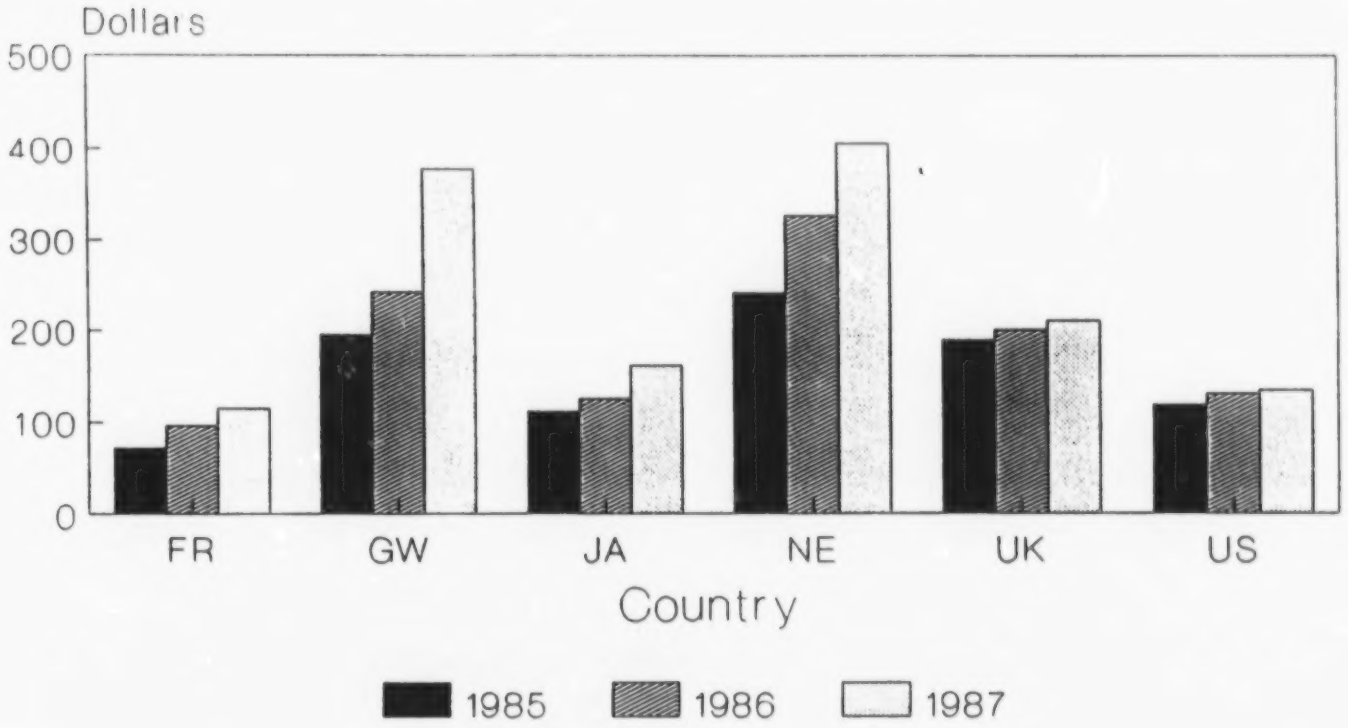
[6] Dougherty, Richard M. The Inflation of Foreign Journal Prices. Unpublished presentation to the University of Michigan College of Literature, Science and the Arts Faculty, Mar. 9, 1987.

[7] Okerson, op. cit., p. 5.

[8] Ibid.

[9] Lenzini, op. cit., p. 5.

Serial Cost Comparison
Foreign vs. U.S., 1985-87



CRS-5
Figure 2

FR-France;GW-West Germany;JA-Japan;
NE-Netherlands;UK-United Kingdom
Source: The Faxon Company

to plan for increases of another 25-30 percent in 1988.[10] The average price of a foreign journal handled by the Faxon Company will have grown from $81.77 in 1985 to an estimated $148.78 in 1988 an increase of over 80 percent.

The consequences of these price changes have been severe budget problems for U.S. research libraries. In 1987, Stanford University was forced to cut its book acquisition and journal subscriptions by $600,000.[11] Similarly, Harvard University and The University of California, Berkeley, overran their serial budgets by $480,000 and $300,000 respectively.[12] And the University of Michigan anticipates having to make up a shortfall of $630,000 in 1988 by large cuts in its acquisitions and subscriptions.[13]

In addition to the gross dollar amounts, universities found that an increasing share of their serials budget, and cost growth, was being dominated by a relatively small percentage of their journal subscriptions. These were journals published by the major international publishers. The bulk of these journals are in the science and related fields where research is growing the fastest. At Louisiana State University, for example, three publishers - one from the Netherlands, one from England and one from West Germany -- account for 25 percent of the LSU serials budget.[14] On average, about one-third of a given research library's serials collection accounts for about two-thirds of its serials costs.[15]

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[10] Budget Planning for Faxon Clients. The Faxon Co., Westwood, Mass., Jan. 1988.

[11] Library Hotline, May 27, 1987. p. 3.

[12] Libraries Stunned by Journal Price Increases. Science, v. 236, May 22, 1987. p. 908.

[13] Dougherty, op. cit., p. 4.

[14] Science, op. cit., p. 908.

[15] Okerson, op. cit., p. 106.

In another study, library researchers at LSU discovered that relatively few titles accounted for the majority of price increases over the past seven years.[16] The total price increase per publisher for journals published from 1981 to 1987 was divided into fourths (quartiles). The number of journals whose individual price increases summed to the bottom quartile of the price increase was determined for each of the three largest publishers. This determination was repeated for the each of the succeeding three quartiles. For each publisher, less that 6 percent of the titles constituted the top quarter of the total price increase while over 50 percent of the titles made up the bottom quarter of the total price increase. The distribution by quartile for the three publishers--Pergamon, Elsevier and Springer -- is shown in Figure 3.

While no analysis was given for this pattern, the journals making up the top two quartiles of the price increase were concentrated in the biomedical and materials sciences. These have been fast growing science and technology fields in recent years in terms of journal growth.[17] Further research could examine the relationship between this pattern and factors which may affect price increases such as growth in the number of pages and the existence of competitive journals.

DISCUSSION

There are many reasons given for the increase in journal costs in addition to the decline in the dollar. Publishers argue that publication costs -- printing, paper, labor, etc. -- have risen faster than inflation and that comparison with the CPI is not relevant. They cite the large growth in the size of journals, particularly science journals, as a contributor. The Journal

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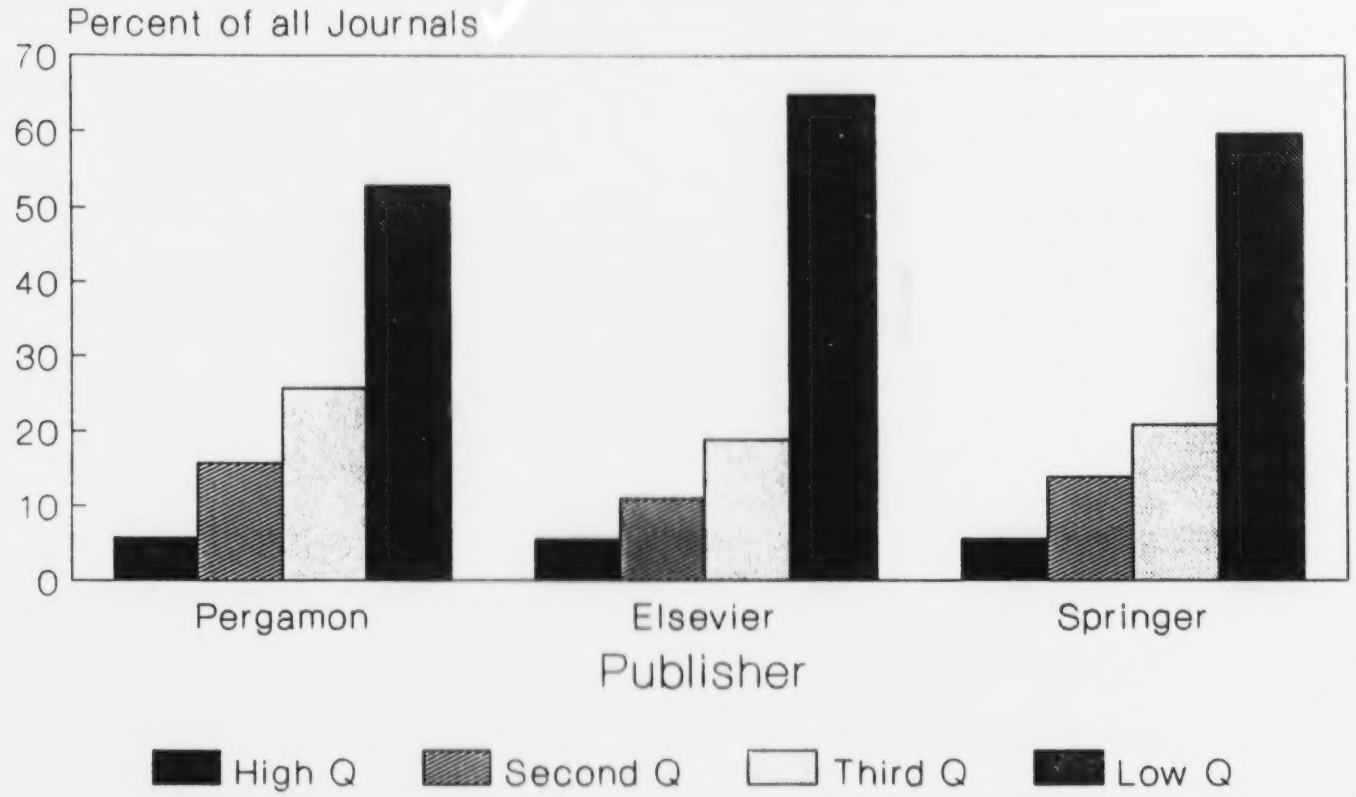
[16] Grinnel, Stuart F. The 6 Percent Effect. Library Issues, v. 8, no. 4, Mar. 1988.

[17] Serials trends: scientific publishing boom. Ulrich's News, v. 1, no. 3, Apr. 1988.

Serial Cost Increases, 1981-1987

Percent of Journals per Quartile (Q) of Total Cost Increase



Source: Library Issues, March 1988

CRS-8
Figure 3

of Physical Chemistry, for instance, grew from 5000 pages in 1982 to 7000 pages in 1986 while Organic Metallic Chemistry increased from 1800 to 2600 pages over the same period. In addition, there has been a large growth in the number of journals in some fields. Computer science, microbiology, and materials science and engineering are three such fields. Publishers claim that the startup costs for these journals contribute to overall serial price increases. Another factor cited by librarians are costs incurred paying for consulting editors. These are individuals (usually university faculty) who are not on the journal's in-house staff but who sit on the journal's editorial board to provide policy guidance for the journal. Competition among journals for a limited number of prestigious consulting editors has driven consulting fees up. Reports of such editors receiving as much as $20,000 per year from some scientific journal have been verified.[18]

Most librarians feel that a major factor driving up journal costs over the past several years is the growing concentration of journal publishers. They cite the fact that publishers have generally regarded the library market as relatively price inelastic. As a result, libraries claim that publishers charge whatever the market will bear and, therefore, reap very large profits from this sector of their market. Since the concentration has intensified with the purchase of some U.S. publishing firms by foreign publishers (most prominently by Elsevier of the Netherlands), libraries expect that the large price increases will continue unless major action is taken by the libraries themselves.

The large price increases and the prospect for their continuation has prompted substantial library response. In addition to the individual research

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[18] Hamaker, et al. Unpublished memorandum, Dec. 6, 1987. p. 4.

libraries, organizations such as the American Library Association, the Association for Research Libraries (ARL) and the Special Libraries Association have expressed concern, and have urged further study and action. Recently, the ARL commissioned a study to determine more precisely the many causes of price rise. The objective of the study is to suggest actions that libraries may take to bring about a moderation of the rate of increase.

For the present, the major response has been cancellation of subscriptions and reduction, where possible, of book purchases so that funds that were to have been used for the latter could be used for needed journal subscriptions. In one case the library's budget shifted from a 50-50 split between serials and monographs to 65 percent serials and 35 percent monograph.[19] Another library reports that it had reached a ratio of 76 percent serials and 24 percent monographs. Not all libraries have seen such a budget shift, although many who have not feel that they will be facing problems soon if the pricing trends continue.

Also libraries are beginning to be more aggressive in voicing concerns to individual publishers about high prices. Other actions include examination of usage patterns of journals by researchers within the university (libraries are finding that several subscriptions are being used by only one faculty member), reducing duplicate subscriptions, cooperative collection development and publicizing particularly egregious pricing practices on the part of various publishers.[20] Selective cancellations -- for example, the University of Texas at Austin recently cancelled its subscription to the entire set of journals

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[19] Paying the Piper: ARL Libraries Respond to Skyrocketing Journal Subscription Prices. The Journal of Academic Librarianship. v. 14, no. 1, Mar. 1988, p. 7.

[20] Okerson, op. cit., p. 115.

translated from Russian, all of which came from one publisher, because of excessive prices -- are also being used to pressure publishers.[21] As an apparent example of the result of such "aggressive" behavior, the library at Idaho State University received an offer from one publisher of a rollback in prices on certain journals of as much as 20 percent.[22] As a corollary to selective cancellation, some library officials are urging that the editors and editorial advisors of the cancelled journals also be informed of why the cancellation is being made. Libraries are attempting to make the serial market much more price elastic.

Another option advocated by many libraries is to increase the use of page charges.[23] These are charges made to authors to help offset the cost of publications, and part of the cost burden of the journal onto the researcher. Where page charges now exist, the cost per thousand characters is generally lower than for journals that do not require page charges. Researchers, on the other hand, do not like them because they use research funds that could be going directly to the project.

The major barrier to implementing page charges is that it is very difficult to get most publishers to agree to them. Indeed, page charges are still used by several scientific societies in the United States. These charges, however, have declined in recent years in many disciplines. The principal reason for this drop off is the appearance of competitive journals, published by private publishers, which do not have page charges. If these

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21 Ibid., p. 2.

22 Ibid., p. 5.

23 Barschall, Henry H. The Cost-Effectiveness of Physics Journals. Physics Today, v. 41, no. 7, July 1988, p. 59.

journals are accepted by the scholarly community, researchers will usually choose to publish in them in order to avoid page paying page charges.

For the longer term, the increase in electronic networks may help to increase access to published material and make greater sharing of collections more attractive. While such networks are now developing, libraries are finding that they must pay for the equipment and operation of these networks in addition to, rather then in place of, journal subscriptions. Also, there currently is no inexpensive way to transmit graphics on electronics networks.[24] Finally, even if network access could supplant journals for immediate access to research results, there remains the necessity to archive information in some form -- paper, optically scanned disks or probably both -- for future use. Therefore, while studies have pointed out the importance of developing a nation-wide electronic research network,[25] whether such a network would generate significant cost savings for research libraries in the long run is highly uncertain.

The expansion of "desktop" publishing resulting from new computer technology, may also help as some scholarly societies and organizations once again take over publishing their own journals. There has been a trend in the past several years of many of these groups turning their journal publications over to publishing companies. Such restorations would help increase publication competition which, when combined with reduced costs of the new publication technology, could help keep prices steady.

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[24] Barschall, op. cit., p. 59.

[25] A Research and Development Strategy for High Performance Computing, Executive Office of the President, Office of Science and Technology Policy, Nov. 20, 1987.

A recent study designed to measure of cost effectiveness of scientific journals lends some support to this argument.[26] The study examined over 200 physics journals to determine first, their cost per thousand printed characters and second, the impact of those journals. The latter was defined by the number of times an article which appeared in the 1984 or 1985 editions of a given journal, was cited by articles appearing in the 1986 editions of that same journal. This definition is based on the assumption that the more important article is, the more it will be cited. A cost-effectiveness index was defined as the ratio of the impact number to cost per thousand characters. The higher the index, the more cost-effective the journal was judged to be. The cost per thousand characters ranged from 0.39 cents to 31 cents while the cost-effectiveness index spanned from 0.018 to 15.9 over the 200 journals.

An interesting discovery in this analysis was the sharp difference in both cost and cost-effectiveness index between physics journals published by professional societies and those published by private publishers. In figure 4, this is shown for four professional societies and four publishers. In this case, all of the publishers had higher costs per thousand characters and lower cost effectiveness indexes than the professional societies. In the study, 12 professional societies were examined and 12 publishers. Only two of the professional societies had lower cost-effectiveness indexes and higher costs per thousand characters than any of the 12 publishers.

These data indicate that publications by the physics professional societies are more cost-effective than private publishing companies. They do not, however, provide clear evidence why this may be the case, nor can necessarily be carried over to other journal subjects. The results suggest

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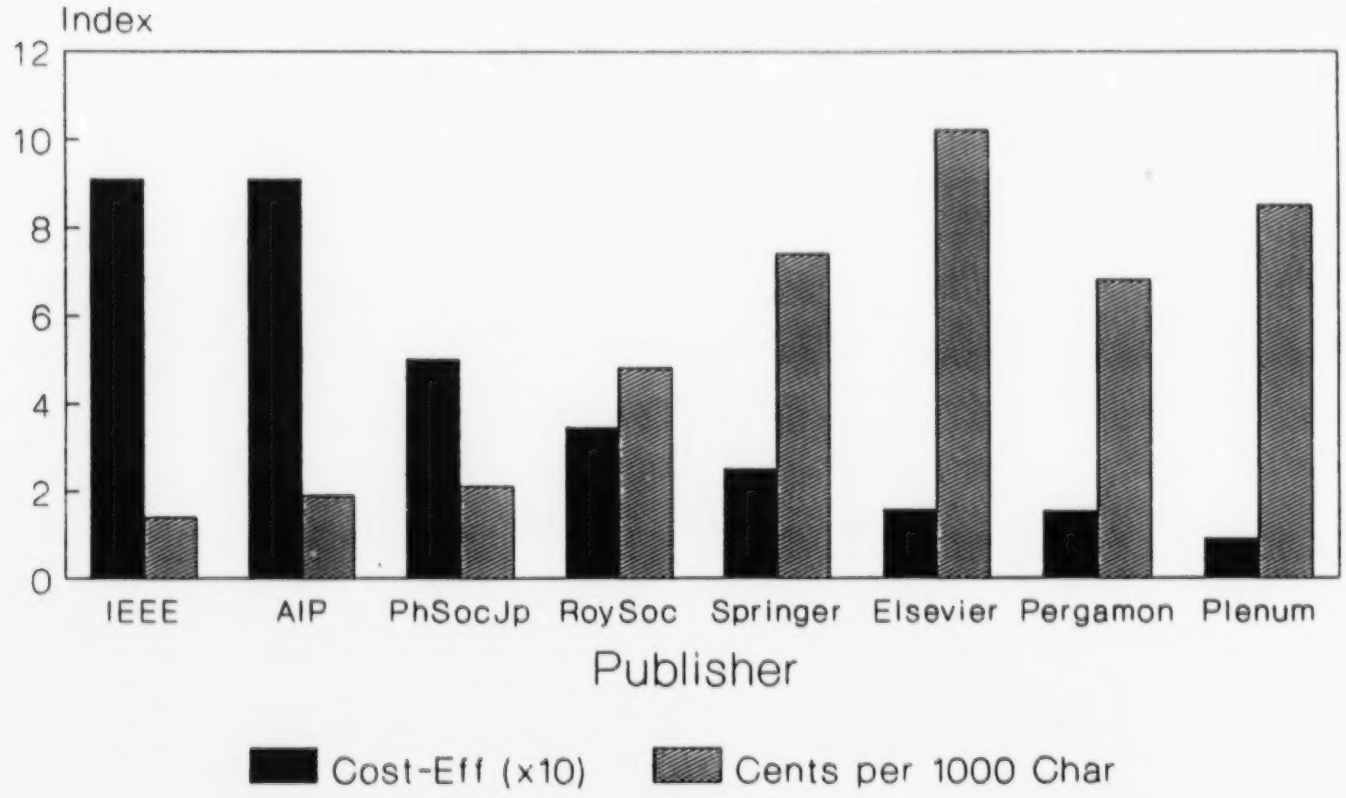
[26] Barschall, op. cit., p. 56-59.

Serial Cost Effectiveness
Physics Journals



Source: Physics Today, July 1988

CRS-14
Figure 4

that additional research for other science and engineering fields would be helpful to see if this trend is unique to physics. Of particular importance would be the biomedical field which has seen the greatest proliferation of new journals in the past several years, and which contributes a large share of the highest priced journals. If this trend does hold across science and engineering fields, it is probably a strong argument for encouraging more publishing by professional societies rather than less which has been the case in recent years.

Finally, the recent stabilization of the dollar should begin to show up in 1989 serial purchases by libraries and may keep the problem from getting much worse, after 1988, at least for a few years. From July 1987 to July 1988, there has been no change in the value of the Dutch guilder per dollar. It needs to be emphasized, however, that such stabilization will do nothing about the high prices already extant. Since large increases in library budgets in the near future are improbable, libraries are not likely to be able to avoid continued cancellations and reduction in domestic book purchases even if the dollar remains stable.

The consequences of cancellations of significant numbers of journals by research libraries has not yet been analyzed extensively. Some studies have been performed on the contribution to science and engineering research productivity of access to the latest science and technology information. In a report prepared by CRS, it was stated that such access can save considerable time and money by reducing duplication of experiments.[27] While the CRS report

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[27] U.S. Congress. House. Committee on Science and Technology. The Impact of Information Technology on Science, Science Policy Study Background Report No. 5. 99th Cong., 2d Sess., Prepared by the Congressional Research Service, Library of Congress. Washington, U.S. Govt. Print. Off. Sept. 1986, p. 32-34.

pointed out the importance of timely access to the latest science and technology information, it said nothing about how such access might be compromised if journal subscriptions were curtailed at research libraries. Indeed, the CRS analysis emphasized that expansion of electronic information transfer technology was important if the objective of rapid delivery was to be met. In some fields where research results are breaking fast, such as high temperature superconductivity, most of the information transfer occurs at meetings, and the sending and receiving of informal reports, rather than published journals because of their inherent publication time delays.

The published articles do serve an important purpose, however, since they are the principal means of recording, transmitting and archiving the peer reviewed research results for the worldwide research community. Cancellations of important research journals, therefore, will mean that many faculty and researchers will find it more difficult to get access to the definitive research publications in their field. The growth of international participation in most research fields, particularly in the sciences, will exacerbate this difficulty since it is likely that the international journals will be subject to the major share of the cancellations.

Subscriptions to new journals also have been a particular target of libraries' response to rising prices.[28] This has caused considerable concern among these libraries who feel that their support of new or expanded research activities will be severely hampered without the new journals in these fields. Many libraries will not purchase any new journals unless requesters identify other journals for cancellation or provide additional money from their research grants to pay for the new subscription.

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[28] Journal of Academic Librarianship, op. cit., p.7.

When rising prices first began threatening journal subscriptions, most researchers who expressed an opinion on the serial cost problems facing libraries, felt that the price should be paid rather than increasing cancellations.[29] More recent indications, however, show that some faculty are trying to help by such things as assigning priorities to journals, urging increased funds for the library's serials budget.[30] It appears important that efforts to ease the problem by reducing journal subscriptions should involve all affected parties.

In this connection, it appears that the important question about the effects of cancellation of scholarly journals by research libraries is not whether access to published information by itself is important for effective research, but how good that access should be. This question needs to be explored more fully to see what the consequences of significant cancellations will be to the Nation's research efforts. If timely, broad scale access to research results can be maintained through means such as meeting attendance, electronic networks and exchange of informal reports, then perhaps greater sharing of collections of published research results may not be damaging. If, however, such access is not feasible or cannot be a complete substitute for the peer reviewed publication, then greater concentration of collections by research libraries will reduce research productivity. Any further analysis of the journal price problem should pay serious attention to this question.

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[29] Dougherty, op. cit., p. 8.

[30] Journal of Academic Librarianship, op. cit., p.6.